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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,674	07/07/2006	Shigetaka Sakakibara	2271/76516	4701

23432 7590 02/23/2011

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EXAMINER	
TRAN, DUNG D	

ART UNIT	PAPER NUMBER
2625	

MAIL DATE	DELIVERY MODE
02/23/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,674	SAKAKIBARA ET AL.	
	Examiner	Art Unit	
	Dung D. Tran	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-10 and 12-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-10,12-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action filed 12/2/2010 has been entered and made of record.

2. Claims 1, 7-10 and 12-25 have been amended to further define the claimed invention.

Claims 4 and 11 have been cancelled.

Claims 1-3, 5-10 and 12-15 remain pending in this application.

3. Applicant has amended claim 8 to overcome the claim objection due to informalities. Accordingly, the objection to claim 8 is withdrawn. Claims 1-15 have been amended to overcome rejection under 35 U.S.C § 112, second paragraph. Claims 1-7 and 14 have been amended to overcome rejection under 35 U.S.C § 101. Accordingly, the rejection under 35 U.S.C. §112 and the rejection under 35 U.S.C. § 101 are withdrawn.

4. Applicant's arguments have been fully considered but they are not persuasive. Applicant argues that Chang does not teach or suggest the aspects of the present application of causing to be performed by the image forming apparatus, an image forming process including *forming black only with the black recording liquid until the maximum black recording liquid incorporation amount is reached* and, when the maximum black recording liquid incorporation amount is reached, forming black with a combination of (i) a composite black using a mixture of the cyan recording liquid, the magenta recording liquid, and the yellow recording liquid and (ii) the black color in a

same amount as the maximum black recording liquid incorporation amount. Examiner respectfully disagrees with that since Chang teaches forming black only with black recording liquid (from figure 2, this occurs before the first threshold at 25% of gray component density and column 3, lines 27-29) until the maximum black recording liquid incorporation amount is reached (from figure 2, the second threshold at 35% of gray component density where black reaches maximum and becomes constant). Chang teaches two thresholds as shown in figure 2, the first threshold is approximately where cyan, magenta and yellow inks will begin to combine with black ink to produce black in the printed image and the second threshold is the point where the value of black ink becomes a constant (column 2, lines 35-42). From figure 2, the amount of CMY component appears to be closed to 0% while the gray component density is below the second threshold at 35% and after black reaches its maximum at 35% gray component density, CMY starts to increase.

5. At the time of invention, there had been a recognized problem or need in the art to print quality output image with the least amount of time to process the output image. There were a finite number of identified and predictable potential solutions to the recognized need or problem which were to allow the consolidation of two thresholds as taught by Chang into a single threshold where, when cyan, magenta and yellow inks begin to combine with black ink to produce black in the printed image, the value of black ink would becomes a constant. One of ordinary skill in the art could have pursued the known potential solution with a reasonable expectation of success since the solution

would provide the ability for the system to run faster to produce quality output image in less amount of time.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1, 3, 5-8, 10, 12-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,765,693 B1 to Chang in view of U.S. Patent No. 7,570,375 to Morisaki et al and in further view of U.S. Patent No. 5,162,860 to Nami et al.

8. As to **claim 1**, Chang discloses an image processing method (method of figure 3) for performing an under color removal process (determining gray component value, step 32, figure 3) and a black recording liquid incorporation process with respect to an input three-color signal (process of figure 3), and generating image data for an imaging image forming apparatus that is configured to form a color image on a recording medium using at least a cyan recording liquid, a magenta recording liquid, a yellow recording liquid, and a black recording liquid (CMYK four color process, column 3, lines 40-45), the method comprising the steps of:

regulating a maximum black recording liquid incorporation amount (second threshold when the value of black ink become constant, column 2, lines 35-45) whereby

glossiness of black realized in an image formed on a glossy recording medium is not substantially degraded,

the maximum black recording liquid incorporation amount being a black recording liquid incorporation amount (see figure 2, after the second threshold of 35% component density, the value of black ink become constant, column 2, lines 35-45 and page 2, lines 6-7 of certification of correction) that does not cause a glossiness of a recorded portion to become lower than a glossiness of a recording medium when recording is made with a patch of (R, G, B) = (0, 0, 0) input at maximum grayscale; and

causing to be performed, by the image forming apparatus, an image forming process including forming black only with the black recording liquid (from figure 2, this occurs before the first threshold at 25% of gray component density, column 3, lines 27-29) until the maximum black recording liquid incorporation amount is reached and, when the maximum black recording liquid incorporation amount is reached (at 35% of gray component density, black becomes constant, figure 2 and column 2, lines 40-42), forming black with a combination of (i) a composite black using a mixture of the cyan recording liquid, the magenta recording liquid, and the yellow recording liquid and (ii) the black color in a same amount as the maximum black recording liquid incorporation amount (black stay constant and other colors are adjusted accordingly, column 3, lines 31-34).

Chang does not expressly disclose forming black only with the black recording liquid *until the maximum black recording liquid incorporation amount is reached*.

Chang teaches two thresholds as shown in figure 2, the first threshold is approximately where cyan, magenta and yellow inks will begin to combine with black ink to produce black in the printed image and the second threshold is the point where the value of black ink becomes a constant (column 2, lines 35-42). From figure 2, the amount of CMY component appears to be closed to 0% while the gray component density is below the second threshold at 35% and after black reaches its maximum at 35% gray component density, CMY starts to increase.

At the time of invention, there had been a recognized problem or need in the art to print quality output image with the least amount of time to process the output image. There were a finite number of identified and predictable potential solutions to the recognized need or problem which were to allow the consolidation of two thresholds as taught by Chang into a single threshold where, when cyan, magenta and yellow inks begin to combine with black ink to produce black in the printed image, the value of black ink would becomes a constant. One of ordinary skill in the art could have pursued the known potential solution with a reasonable expectation of success since the solution would provide the ability for the system to run faster to produce quality output image in less amount of time.

Chang does not expressly disclose whereby glossiness of black realized in an image formed on a glossy recording medium is not substantially degraded, and glossiness of a recorded portion not to become lower than a glossiness of a recording medium when recording is made with a patch of (R, G, B) = (0, 0, 0) input at maximum grayscale.

Morisaki, in the same area of inkjet printing, discloses that the black and white image formed on a glossy recording medium is not substantially degraded (print data for color mixing mode is generated when printing on glossy paper so that the output image is not deteriorated, column 7, lines 20-32 and S22-23 of figure 6, the black image would correspond to a patch of (R, G, B) = (0, 0, 0)).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang's image processing method by the teaching of Morisaki because it would allow the method to enhance the output image quality by adjusting the black according to specific recording mediums such as glossy paper.

Chang, as modified by Morisaki, still does not teach the glossiness of black realized in an image.

Nami, in the same area of color image printing apparatus, discloses the glossiness of black realized in an image (controlling the black glossiness of an output image, abstract and column 10, lines 51-57, glossiness can be lower or rise by controlling coefficient K, column 8, lines 10-32).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang/Morisaki's image processing method by the teaching of Nami because it would allow the method to enhance the overall output image glossiness regardless of color of each object in the output image, and an image with excellent quality could be obtained.

9. As to **claim 3**, Chang further discloses wherein the maximum black recording liquid incorporation amount is regulated in the black recording liquid incorporation process according to characteristics of the recording medium, and is arranged to be greater than 0% and less than 52% (maximum value of black is 33%, page 2, lines 1-2 of certificate of correction).

Chang does not expressly disclose the black recording liquid incorporation process according to characteristics of the recording medium.

Nami, in the same area of inkjet printing, discloses the black recording liquid incorporation process according to characteristics of the recording medium (column 3, lines 53-64).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang/Morisaki's image processing method by the teaching of Nami because it would allow the method to enhance the output image quality by adjusting the black according to specific recording mediums such as glossy paper.

10. As to **claim 5**, Chang further disclose wherein an under color removal amount for the under color removal process is set to 100% (BG/UCR is at 100%, column 3, lines 27-30).

11. As to **claim 6**, Chang further disclose wherein an under color removal amount for the under color removal process is set to 100% until the under color removal amount reaches the regulated maximum black recording liquid incorporation amount (BG/UCR is at 100% if gray component density is below first threshold, column 3, lines 27-34).

12. As to **claims 8, 10, 12-13**, claims 8, 10, 12-13 are for an imaging apparatus (printing system, column 2, lines 32-33) correspond to method claims 1, 3, 5-6. Therefore they have been analyzed and rejected based on method claims 1, 3, 5-6 respectively.

13. As to **claim 7**, claim 7 is for a printer driver (Morisaki, column 5, lines 50-59) stored in a non-transitory computer readable medium and embodying a program of instructions executable by a computer configured to perform the method of claim 1. Therefore it has been analyzed and rejected based on method claim 1.

14. As to **claim 14**, Chang discloses an image processing apparatus that is configured to generate image dater for an image forming apparatus (printing system, column 2, lines 32-33) that forms a color image on a recording medium using at least a cyan recording liquid, a magenta recording liquid, a yellow recording liquid, and a black recording liquid (CMYK four color process, column 3, lines 40-45), the apparatus comprising:

a printer driver stored in a non-transitory computer readable medium (processor, column 4, lines 7) and embodying a program of instructions executable by the image processing apparatus to (a) perform an under color removal process and a black recording liquid incorporation process with respect to an input three-color signal (process of figure 3), (b) regulate a maximum black recording liquid incorporation amount (second threshold when the value of black ink become constant, column 2, lines 35-45) whereby glossiness of black realized in an image formed on a glossy recording medium is not substantially degraded, the maximum black recording liquid incorporation

amount being a black recording liquid incorporation amount (see figure 2, after the second threshold of 35% component density, the value of black ink become constant, column 2, lines 35-45 and page 2, lines 6-7 of certification of correction) that does not cause a glossiness of a recorded portion to become lower than a glossiness of a recording medium when recording is made with a patch of (R, G, B) = (0, 0, 0) input at maximum grayscale, and (c) cause to be performed, by the image forming apparatus, an image forming process including forming black only with the black recording liquid (from figure 2, this occurs before the first threshold at 25% of gray component density, column 3, lines 27-29) until the maximum black recording liquid incorporation amount is reached and, when the maximum black recording liquid incorporation amount is reached (at 35% of gray component density, black becomes constant, figure 2 and column 2, lines 40-42), forming black with a combination of (i) a composite black using a mixture of the cyan recording liquid, the magenta recording liquid, and the yellow recording liquid and (ii) the black color in a same amount as the maximum black recording liquid incorporation amount (black stay constant and other colors are adjusted accordingly, column 3, lines 31-34).

Chang does not expressly disclose forming black only with the black recording liquid *until the maximum black recording liquid incorporation amount is reached*.

Chang teaches two thresholds as shown in figure 2, the first threshold is approximately where cyan, magenta and yellow inks will begin to combine with black ink to produce black in the printed image and the second threshold is the point where the value of black ink becomes a constant (column 2, lines 35-42). From figure 2, the

amount of CMY component appears to be closed to 0% while the gray component density is below the second threshold at 35% and after black reaches its maximum at 35% gray component density, CMY starts to increase.

At the time of invention, there had been a recognized problem or need in the art to print quality output image with the least amount of time to process the output image. There were a finite number of identified and predictable potential solutions to the recognized need or problem which were to allow the consolidation of two thresholds as taught by Chang into a single threshold where, when cyan, magenta and yellow inks begin to combine with black ink to produce black in the printed image, the value of black ink would becomes a constant. One of ordinary skill in the art could have pursued the known potential solution with a reasonable expectation of success since the solution would provide the ability for the system to run faster to produce quality output image in less amount of time.

Chang does not expressly disclose whereby glossiness of black realized in an image formed on a glossy recording medium is not substantially degraded, and glossiness of a recorded portion not to become lower than a glossiness of a recording medium when recording is made with a patch of (R, G, B) = (0, 0, 0) input at maximum grayscale and the apparatus comprising a printer driver.

Morisaki, in the same area of inkjet printing, discloses that the black and white image formed on a glossy recording medium is not substantially degraded (print data for color mixing mode is generated when printing on glossy paper so that the output image is not deteriorated, column 7, lines 20-32 and S22-23 of figure 6, the black image would

correspond to a patch of (R, G, B) = (0, 0, 0)), the apparatus comprising a printer driver (column 5, lines 50-59).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang's image processing method by the teaching of Morisaki because it would allow the method to enhance the output image quality by adjusting the black according to specific recording mediums such as glossy paper.

Chang, as modified by Morisaki, still does not teach the glossiness of black realized in an image.

Nami, in the same area of color image printing apparatus, discloses the glossiness of black realized in an image (controlling the black glossiness of an output image, abstract and column 10, lines 51-57, glossiness can be lower or rise by controlling coefficient K, column 8, lines 10-32).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang/Morisaki's image processing method by the teaching of Nami because it would allow the method to enhance the overall output image glossiness regardless of color of each object in the output image, and an image with excellent quality could be obtained.

15. As to **claim 15**, claim 15 is for an imaging system corresponds to apparatus claim 14. Therefore it has been analyzed and rejected based on apparatus claim 14.

16. **Claims 2, 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,765,693 B1 to Chang in view of U.S. Patent No. 7,570,375 to Morisaki et al

and in further view of U.S. Patent No. 5,162,860 to Nami et al. and in further view of U.S. Patent No. 6,274,282 B1 to Sugimoto et al.

17. As to **claim 9**, Chang discloses an imaging apparatus as recited in the parent claim. Chang does not expressly disclose the cyan recording liquid, the magenta recording liquid, the yellow recording liquid, and the black recording liquid contain pigment.

Sugimoto, in the same area of image printing, discloses the cyan recording liquid, the magenta recording liquid, the yellow recording liquid, and the black recording liquid contain pigment (column 5, lines 50-67 – column 6, lines 1-17).

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Chang's imaging apparatus by the teaching of Sugimoto because colorant pigmented inks are water-insoluble, and the printed products produced using pigment inks accordingly have a good resistance to water, pigments are distinctly inferior to dyes in tinctorial strength and chroma. In addition, compared with dyes, pigment inks also have a lower degree of fadeness to light, with the result that printed products produced using pigment inks fade substantially more slowly.

18. As to **claim 2**, claim 2 is an imaging processing method (abstract) corresponds to apparatus claim 9. The rational provided in the rejection of claim 9 is incorporated herein. In addition, the apparatus of claim 9 performs the method of this claim.

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung D. Tran whose telephone number is (571)270-5309. The examiner can normally be reached on Monday-Friday 8:30AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on (571) 272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625

/D. D. T./
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